

Missouri - Natural Resources Conservation Service

May 2005

Landowner:		Farm #:
Field(s):	Acres:	Tract #:
Soil Map Unit(s):		County:
Designed By:		Approved By:
		Signature:
Date:		Date:

**DEFINITION:** Forest Stand Improvement (FSI) is a forest management technique used to remove unwanted trees from an area in order to improve forest stand composition. In Missouri, young trees readily re-establish themselves following cutting or fire. But tree quality, species composition and individual tree form are often undesirable. Further reduction in quality comes when the better trees are harvested, leaving the lower quality ones. The average unmanaged Missouri woodland produces at less than one-third its potential. The FSI practice can be used to increase the woodland's value for timber products, water quality and quantity, recreation, wildlife, natural beauty, or special products.

**PURPOSE:** (check all that apply)

- ☐ Increase quantity and quality of forest products
- ☐ Restore natural plant communities
- ☐ Enhance aesthetic, recreation and open space values
- ☐ Improve of water quality
- ☐ Sequestration of carbon
- ☐ Improve water conservation yield
- ☐ Improve wildlife habitat
- ☐ Reduce damage from wildfire, pests and disease
- ☐ Initiate forest stand regeneration

**SPECIFICATIONS:**

Minimize disturbances to the site such as rutting, soil compaction, excessive disturbance to the litter layer, and the addition of fill material.

Facilitate efficient and safe tree removal by controlling the method, felling direction, and timing of tree cutting. Slash, debris and vegetative material left on the site should not present a fire or pest hazard or interfere with the intended purpose. Protect sensitive areas such as vernal pools, riparian zones, and cultural resources.

Kill unwanted trees, shrubs, and vines by any of the following means: (check all that apply)

- ☐ cutting
- ☐ girdling
- ☐ basal bark spray
- ☐ frilling
- ☐ stem injection
- ☐ foliar spray on small trees



### Even and Un-even Aged Thinning

Base forest stand improvement choices on:

- Relative tree position
- Crown position
- Crown condition
- Tree health
- Stem quality
- Species

For **even-aged** stands with an average DBH of 6 inches or more, Table 1 can be used as a guide for residual stocking after thinning.

Table 1. Thinning guide for even-aged residual stocking

Stand Diameter (inches)	Spacing (feet)	Basal Area (sq. ft.)	Trees/Acre (no.)
<b>Hardwood</b>			
6	13	55	258
8	16	60	170
10	19	65	121
<b>Pine</b>			
6	12	60	304
8	14	75	222
10	16	90	170

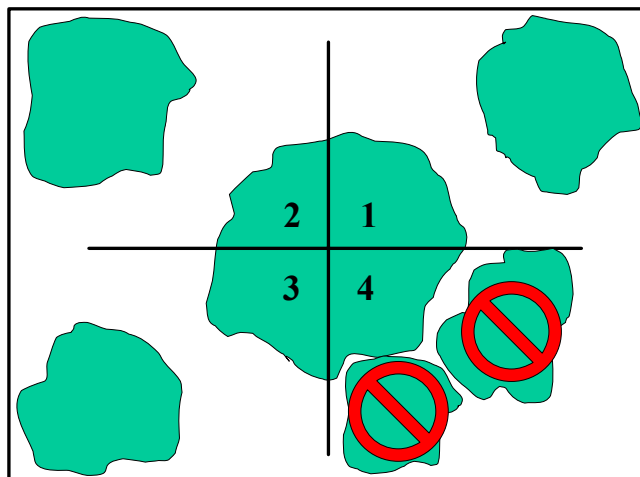
For **uneven-aged** stands create or maintain age/size classes which occupy an equal amount of ground space per acre. (i.e. 25% seedling/sapling, 25% pole, 25% small sawtimber, 25% large sawtimber) Each improvement activity should:

- regenerate a new age/size class (if needed)
- harvest mature trees and excess numbers in each age/size class
- maintain or develop appropriate age/diameter class distributions

### Crop Tree Release Thinning

Select 20 to 75 crop trees per acre based on the following criteria:

- Dominant or codominant canopy tree
- Healthy crown
- Minimal epicormic branching
- Good form
- Free of defects and disease
- Desired species
- Adapted species



Remove all trees in direct, adjacent competition with the crop trees. For optimum response, provide at least 10 to 15 feet of crown growing space on all quadrants of residual crop trees.

*Remove all trees in direct competition with the crop trees.*

### STAND SPECIFIC RECOMMENDATIONS:

Circle proposed activity and level of thinning.

Thinning Levels	Basal Area Reduction	Crop Tree
Light	< 30 sq. ft.	10-20 trees
Medium	30-40 sq. ft.	21-40 trees
Heavy	>40 sq. ft.	>40 trees

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Stand(s): _____	Basal Area (sq. ft.)	Trees/acre
Existing	_____	_____
Planned	_____	_____
Reduction	_____	_____

Stand(s): _____	Basal Area (sq. ft.)	Trees/acre
Existing	_____	_____
Planned	_____	_____
Reduction	_____	_____

If *chemical weed control* is needed, use the following products at label rates:

Stand	Herbicide	Treatment

**When choosing herbicides, review leaching, runoff potential, setback requirements, persistence, and toxicity ratings of chemical formulations. Use the safest available herbicide. Pesticides used improperly can be injurious to man, animals, and plants. *Follow all labels.***

### MAINTENANCE:

- Periodically take out dead or diseased trees to allow more sunlight to reach the ground.
- Rotate thinning through each stand to establish various stages of plant succession and age classes.
- Consider prescribed burning to help adjust community structure or species composition. Burn only under an approved burn plan from NRCS or MDC.



*Always use proper safety equipment when doing forest stand improvement.*

### SITE SPECIFIC COMMENTS AND RECOMMENDATIONS

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